

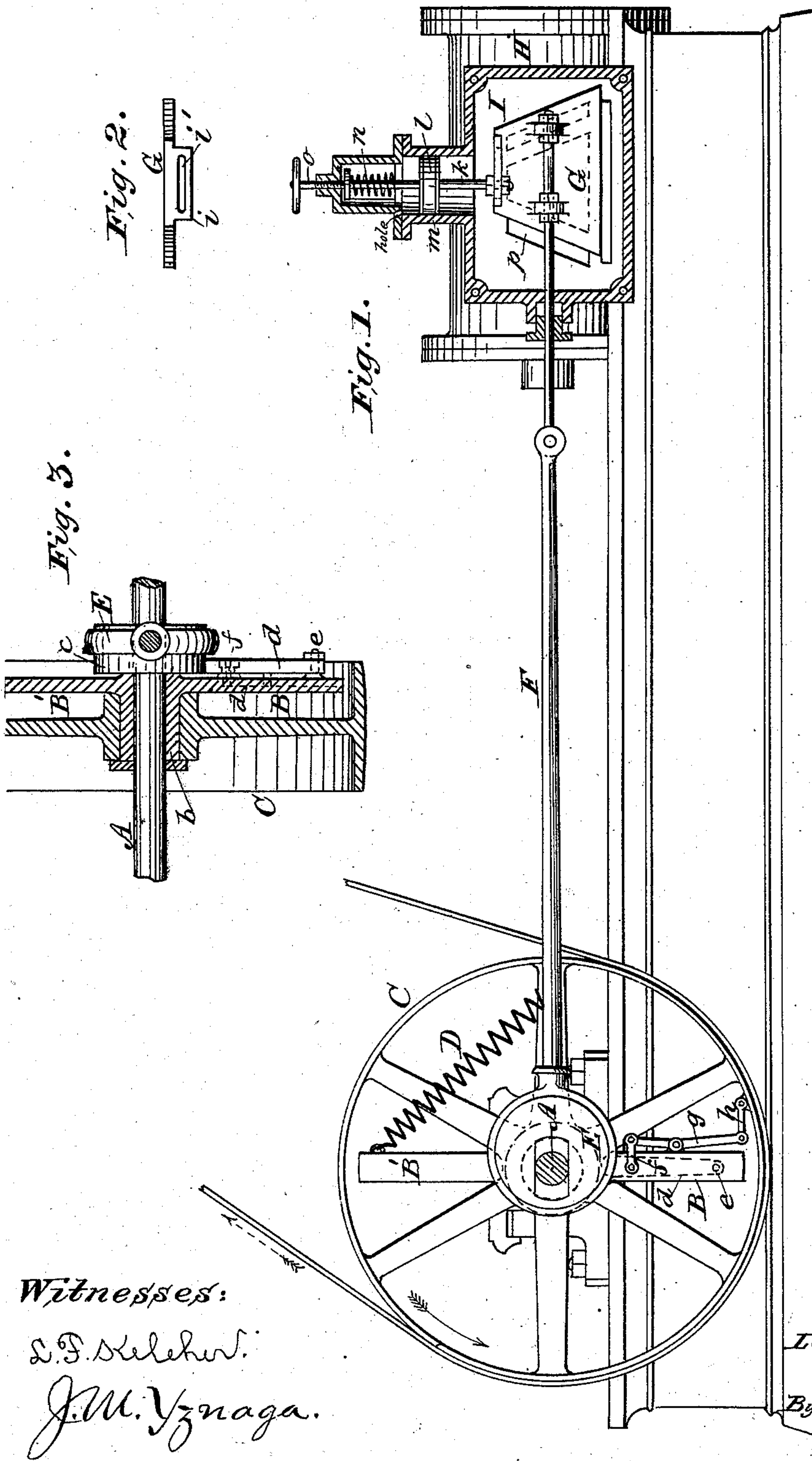
(No Model.)

# LE GRAND SKINNER.

CUT-OFF VALVE GEAR.

No. 282,388.

Patented July 31, 1883.



Witnesses:

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# UNITED STATES PATENT OFFICE.

LE GRAND SKINNER, OF ERIE, PENNSYLVANIA.

## CUT-OFF-VALVE GEAR.

SPECIFICATION forming part of Letters Patent No. 282,388, dated July 31, 1883.

Application filed May 29, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, LE GRAND SKINNER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Cut-Off-Valve Gear; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in cut-off-valve gear; and the object is to produce a cut-off-valve gear that is automatic in its operation, very sensitive in its action, and by which the cut-off valve can be regulated in relation to the varying load of machinery, as well as against the varying pressure of the steam.

The invention consists in the construction and arrangement of parts, as will be more fully described hereinafter, and more specifically pointed out in the claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

Like letters indicate like parts in the different figures of the drawings, in which—

Figure 1 is a side elevation, partly in section, of an engine representing my invention; Fig. 2, a top view of the valve employed. Fig. 3 is a detail view of the loose pulley and connections.

In the drawings, A represents the engine-shaft, to which is secured a rigid arm, B, having a hub, *b*, upon which the loose pulley C is placed. To a similar arm, B', a spring, D, or other flexible connection is attached with one end, while the other end is connected to the arm of the pulley, so as to form a tension or dynamic connection. The eccentric-wheel E is provided with a hub, *e*, having an arm, *d*, which is pivoted to the rigid arm B, as at *e*, and to the arm *d* is attached a link, *f*, which connects with a lever, *g*. This lever is pivoted to the arm B, and has at its lower end a link, *h*, attached to it, that is in turn connected to a lug on the rim of the pulley, the object being to shift the eccentric on the shaft as the load is increased or decreased, caused by the tension of the belt being greater or less on the driving side, as shown by the dotted ar-

row. The eccentric-rod F is connected in the usual way to the valve-stem and valve G. This valve is made with oblique sides, and the ports *p* in the cylinder H are inclined to correspond with them. Said valve has at its upper side a lug, *i*, provided with a slot, *i'*. In this slot is arranged a rod, *k*, attached to a piston, *l*, in the pressure-cylinder *m*, which is open below and in communication with the steam-chest I or other portion of the engine, so that it can be operated by the boiler pressure. At the upper end of the cylinder *m* is arranged a spider, which forms a bearing for a spring, *n*, placed around the extended end of the rod *k*. A screw, *o*, in the head of the cylinder *m* serves to increase or decrease the tension of the spring *n*. This piston operates the valve G, in connection with the dynamic governor on the engine-shaft, in such way that the varying load on said pulley will change the position of the main valve to the engine in proportion to the power required, while at the same time any change of steam-pressure will cause the valve to be raised or lowered by the piston *m*, and thus accomplish the same result, and thus uniting in an engine the results obtained by the dynamic governor and that of the pressure-cylinder, either acting combined or separately to regulate the amount of steam admitted to said engine-cylinder.

Instead of one valve, as shown in the drawings, two or more may be employed, or a separate cut-off and main valve, if desired. The devices may also be arranged to operate in connection with a rotary valve, which may act as a throttle-valve instead of a slide-valve.

I wish it understood that I do not limit myself to the exact construction and arrangement of parts herein shown and described, as many different devices and changes would readily suggest themselves to the mechanic.

I am aware that the dynamic governor has been used in engines, but only against the varying loads, in connection with a steam-pressure-regulating governor. I am also aware that pendulum-governors have been used in connection with a pressure-cylinder, and operated by water-pressure from a main; but these are not so effective or sensitive as when used in connection with a dynamic gov-



ernor, by which a new and better result is obtained.

The operation will be readily understood from the above description by those skilled in the art and will require no further explanation.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a dynamic governor on the engine-shaft with a steam-pressure cylinder, the piston of which is connected with and operates the valve or valves and regulates the amount of steam admitted to the engine-cylinder, substantially as set forth.

2. In an engine, a dynamic governor on the engine-shaft, in combination with a steam-pressure cylinder, both of which are connected with and operate the valve or valves, and serve to regulate the amount of steam admitted to the engine-cylinder, according to the load or steam-pressure, substantially as set forth.

3. In an engine, a pressure-cylinder containing a piston for operating a valve or valves, and regulated by an adjustable spring, in combination with a dynamic governor on the engine-shaft, and serving to regulate the amount of steam admitted to the engine-cylinder.

4. The combination of a dynamic governor, constructed substantially as described, with a valve, G, having oblique sides, and provided with a rod, *k*, piston *l*, spring *n*, and regulating-screw, substantially as specified.

5. In an engine, a dynamic governor arranged on the main shaft of the engine, and connected to a valve, G, in combination with a steam-pressure cylinder containing a piston

for separately or jointly operating and regulating the movement of said valve by the varying load and the varying steam-pressure, substantially as set forth.

6. In an engine, a dynamic governor on engine-shaft, in combination with a steam-pressure cylinder operating and regulating cut-off or main valve through one valve, substantially as specified.

7. In an engine, a valve, G, having oblique sides, and provided with a lug, *i*, having slot *i'*, and connected to a piston, *l*, in the pressure-cylinder *m*, substantially as and for the purpose set forth.

8. The combination of a valve, G, having oblique sides, and connected to a piston, *l*, in a pressure-cylinder, *m*, with a steam-engine cylinder, H, having inclined ports *p*, as shown, and for the purpose described.

9. In an engine, the combination of a dynamic governor on the engine-shaft with a steam-pressure-regulating governor arranged on or near the engine-cylinder, and mechanism whereby the valve is controlled by one or both devices, substantially as set forth.

10. In an engine, a dynamic governor operated by the engine-shaft, with a steam-pressure cylinder operating and regulating a valve which serves to regulate the amount of steam admitted to the engine-cylinder, as specified.

In testimony whereof I affix my signature in presence of two witnesses.

LE GRAND SKINNER.

Witnesses:

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J. M. YZNAGA.